### APPENDIX A - SPECIFICATIONS

#### Sensepoint LEL Combustible Sensor

**Specifications**

- **Gases Detected**: Combustible gases in the LEL range with the sensitivity dependent on gas type.
- **Range**: 0 – 100% LEL Methane. Other gas ranges may vary.
- **Operating Temperature Range**: -40°C to +80°C (See Certification)
- **Operating Humidity Range**: 10% to 99% intermittent - non-condensing
- **Operating Pressure Range**: 90 to 110kPa
- **Warm-up Time**: 10 minutes
- **Voltage Range**: Recommended 1 to 1.5 litres/minute.
- **Expected Operating Life**: 5 years.
- **Poisoning**: The sensing elements may become inactive after extensive exposure to silicones, halogenated hydrocarbons, heavy metals or sulphur compounds.
- **Weight**: 190g.

#### SAFETY

**WARNINGS**

- This apparatus is not suitable for use in oxygen enriched atmospheres (>21%v/v). Oxygen deficient atmospheres (<10%v/v) may suppress sensor output.
- This apparatus is not suitable for use in atmospheres enriched with oxygen (>21%v/v). Oxygen deficient atmospheres (<10%v/v) may suppress sensor output.
- **ATEX SPECIAL CONDITIONS FOR SAFE USE**
  - The detector must be protected from impact.
  - The integral supply cables must be protected from impact and terminated in a suitable terminal facility.
- **Installation must be consistent with the certification approval.**

**CAUTIONS**

- Atmospheres above 100% LEL may suppress the sensor reading.
- Do not modify or alter the sensor construction as essential safety requirements may be invalidated.
- Ventilate with fresh air.
- Do not use in atmospheres where the concentration of combustible gases is in excess of 10%.

**NOTE**: The control card must have a suitably rated fuse.
3. INSTALLATION
Installation and service must be performed by a qualified installation engineer with the power to the sensor disconnected.

The Sensepoint must be fitted into a suitably Approved Exe or Exd junction box fitted with a suitably approved cable gland. This should be correctly installed before use.

The sensor should be fitted into a location free from direct heat sources. For optimum protection against water ingress ensure that the sensor is installed facing downwards.

See the Sensepoint Gas Sensors Technical Handbook for installation in a duct or in forced air conditions.

Remove the sensor’s protective disc before use by unscrewing the filter housing, removing the filter and then the disc. Discard the protective disc. Refit the filter into the filter housing and replace the filter housing on the sensor.

The field connections should be three-core multi-strand cable with a maximum conductor size of 2.5mm² (14AWG). A screened cable is recommended for optimum performance.

The sensor should be fitted into a threaded hole within the junction box and locked in place with a locknut. Ensure that junction box thread is compatible with sensor thread.

Connect the field and Sensepoint wiring to the junction box connector block as shown in the following diagram. The unit requires 200mA current with a nominal 3V supply.

4. CALIBRATION

4.1 CALIBRATION PROCEDURE
The calibration adjustments are carried out at the control card and gassing is performed at the sensor.

(1) Apply power and allow the sensor to warm up for 10 minutes.

(2) First ensure there is no gas present on the sensor. If combustible gas is suspected to be in the vicinity of the Sensepoint sensor, fit a Flow Housing accessory and flow clean air over the sensor.

(3) Set the zero reading on the control system.

(4) Remove the filter housing or accessory and replace it with a Flow Housing accessory, if not already fitted.

(5) Connect the Flow Housing input to a regulated cylinder, containing a known concentration of target gas at approximately the sensor alarm point (e.g. 50% LEL Methane in air), using nylon or PTFE tubing.

Caution: As some test gases may be hazardous, the Flow Housing outlet should exhaust to a safe area.

(6) Pass the gas through the Flow Housing at a flow rate of approximately 1 to 1.5 litres per minute. Allow the sensor two to three minutes to stabilise.

(7) Adjust the control card to indicate the concentration of the target gas being applied.

Note: It is useful to record the mV output of the sensor via the control card, throughout the life of the sensor to ensure that there are no poisoning effects that will reduce the sensor performance. This would be indicated by a reduction in the mV output for the same gas concentration. It is recommended that the sensor is replaced when 60% loss has occurred.

For calibration using the Weather Protection in high flow applications refer to the technical handbook.

4.2 CROSS CALIBRATION
Caution: Where the user calibrates any sensor using a different gas, responsibility for identifying and recording calibration rests with the user. Refer to the local regulations where appropriate.

When the Sensepoint Combustible LEL sensor is to be calibrated with a gas which is different to the gas or vapour to be detected, it is necessary to calculate the effective concentration of the calibration gas as follows:

1. Obtain the star rating for the calibration gas and the gas to be detected from table 1.
2. Using table 2, look up the correction factor.
3. Multiply the Calibration Gas concentration in %LEL by the correction factor to get the effective concentration.
4. Use the effective concentration when setting up the control card during the calibration procedure.

Table 1 - Star Rating of gases

<table>
<thead>
<tr>
<th>Gas</th>
<th>GAS Number</th>
<th>LEL (%V)</th>
<th>Star Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetone</td>
<td>67-64-1</td>
<td>2.5</td>
<td>5</td>
</tr>
<tr>
<td>Ammonia</td>
<td>7664-41-7</td>
<td>15.0</td>
<td>7</td>
</tr>
<tr>
<td>Benzene</td>
<td>71-43-2</td>
<td>1.2</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 2 - Correction Factor

<table>
<thead>
<tr>
<th>Star Rating of Calibration Gas</th>
<th>Star Rating of Gas to be Detected</th>
</tr>
</thead>
<tbody>
<tr>
<td>8%</td>
<td>7%</td>
</tr>
<tr>
<td>6%</td>
<td>5%</td>
</tr>
<tr>
<td>4%</td>
<td>3% and 1%</td>
</tr>
</tbody>
</table>

4.3 MAINTENANCE

5. MAINTENANCE

6. FAULT FINDING

Caution: There are no user serviceable parts within the Sensepoint sensor. Any attempts to open the sensor case may invalidate the certification requirements.

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Example

- Target gas to be detected is Butane. The calibration gas available is 460%LEL Methane.
- The star rating of Methane is 6 and Butane is 4.
- From Table 2, the correction factor is 1.56.
- The control card should therefore be told the concentration is (46.0 x 1.56) = 72%LEL in order to give an accurate reading for Butane using Methane as a calibration gas.

IMPORTANT

Assuming an average sensor performance, the sensitivity information in tables 1 and 2 is normally accurate to ±20%.

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